

# **NASA SBIR: Proposal Solicitation, Technology Infusion and Post SBIR Opportunities**

**Carol Lewis, JPL SBIR Technology Infusion Manager  
Indrani Graczyk, SMD SBIR Program Manager  
NASA Jet Propulsion Laboratory, California Institute of Technology**



- SBIR Program Overview
- Solicitation and Selection
- Other Funding Opportunities
- Infusion and Commercialization
- Schedule

# SBIR Overview

- NASA's Small Business Innovative Research (SBIR) Program funds small businesses to develop technologies and capabilities that can be used to enhance NASA missions and objectives
- Within SMD, SBIR technologies have been implemented in a variety of missions, both flight and ground
- SBIR contracts are two phase:
  - Phase I: Six month, \$100K study
  - Phase II: Two year, \$600K prototype development
- Goal is Phase III, non-SBIR development funds with a path to infusion into a NASA mission

## SMD missions that infused SBIR technology...



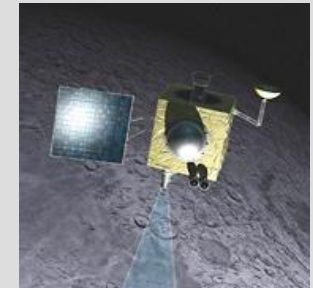
**Hubble**



**MER**



**SOFIA**



**MMM**

**...and many, many more...**





# Advantages of SBIR Work

- **Technical Monitor / COTR**
  - Inside knowledge of NASA technology needs
  - Introduction to other contacts at NASA
- **Center SBIR Technology Infusion Manager**
  - Knowledge of SBIR portfolio and Missions
- **Phase III**
  - Sole source contracting with NASA
- **Credibility for Future Investments**
  - Demonstrated interest from a very large customer

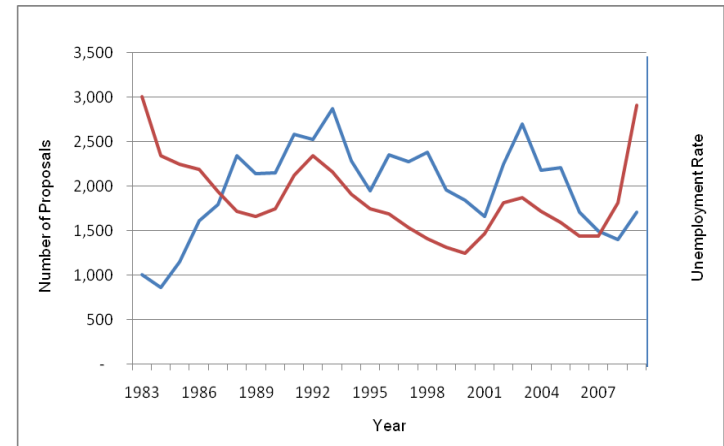
# Current and Future Changes

- Phase 2-e (New for this year)
  - SBIR to match external funds for continuing work up to \$150K
- Recent SBA Guidelines on max funding
  - Phase 1 – \$ 150,000
  - Phase 2 – \$ 1,000,000
  - NASA still well below these levels
- Congressional Reauthorization of SBIR
  - DoD passed separately
  - NASA, others running on extensions
  - Contention: VC owned companies

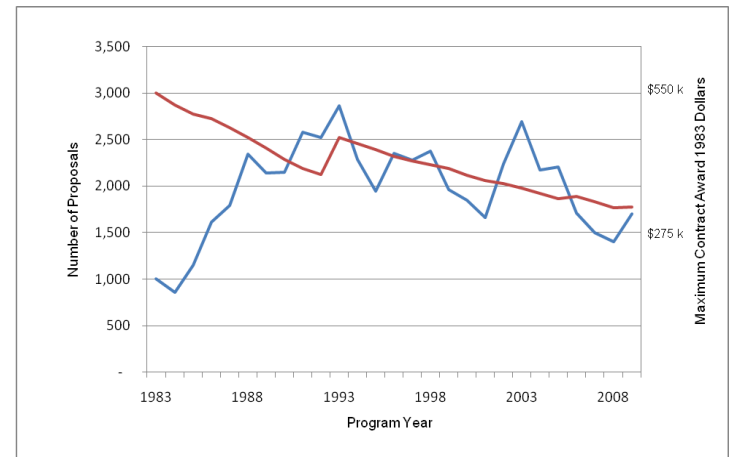


**Possible changes could lead to more competitive SBIR program**

NASA SBIR Proposal Submissions vs. Unemployment Rate

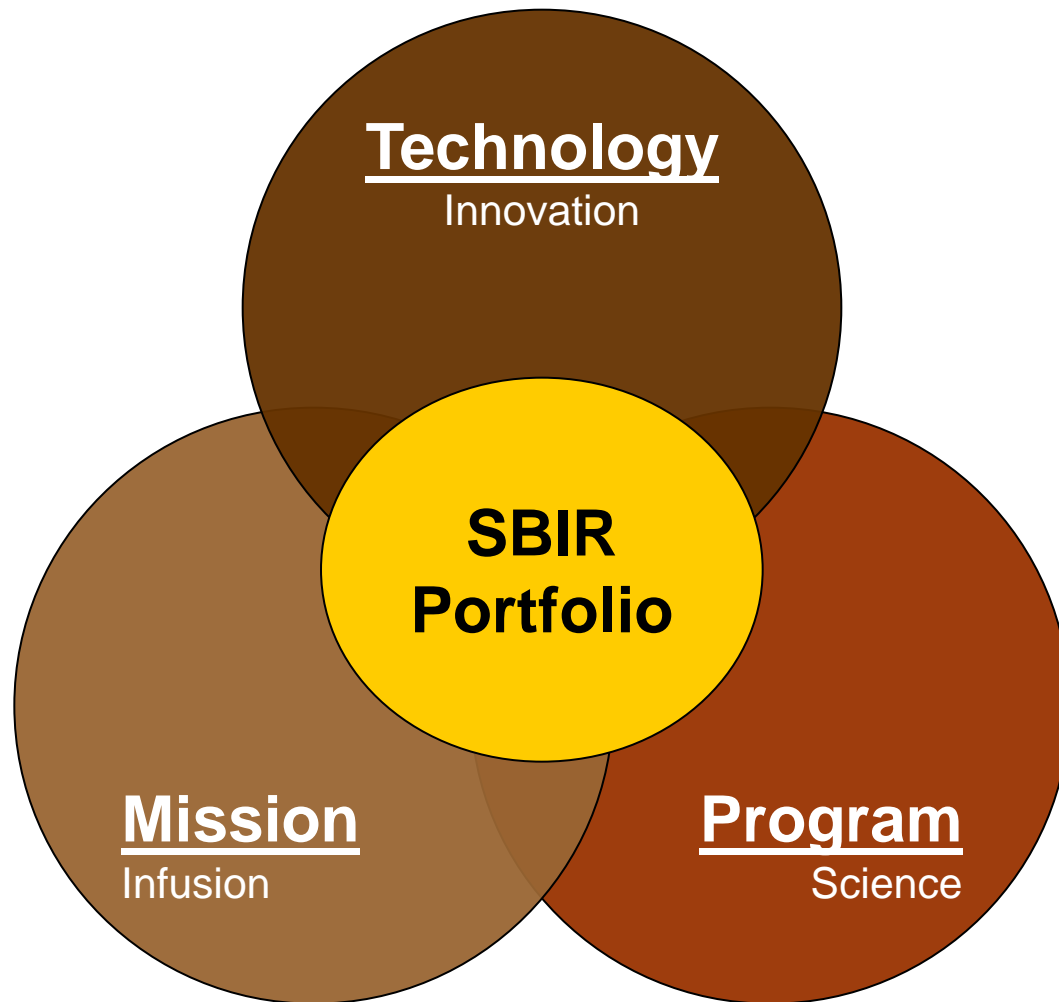


NASA SBIR Proposal Submissions vs. Contract Value



Source: NASA SBIR Program, U.S. Department of Labor

# Solicitation and Selection



***Solicitation and Selection process designed to create a balanced SBIR portfolio aligned to SMD Needs***

# SMD Technology Development Programs

## ■ Research Opportunities in Space and Earth Sciences

- “ROSES” for short
- Omnibus solicitation for SMD
- For 2010: over 50 proposal opportunities
- Proposal due dates span one year
- Awards from \$100K to over \$1M
- <http://nspires.nasaprs.com/> (Go to “Solicitations”, then “Open Solicitations”)

## ■ Mission Specific Technology Development

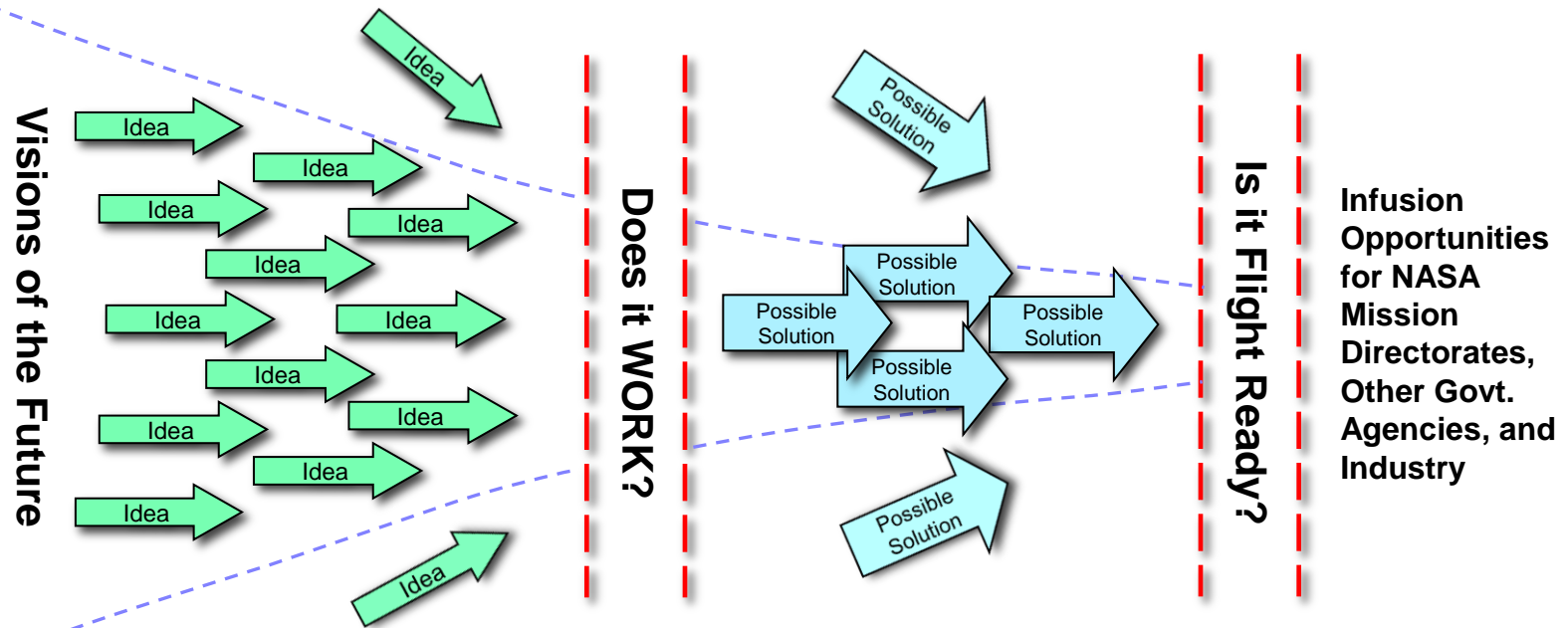
- Large missions have technology budgets
- Know the needs of your end customer

NSPIRES - NASA Research Opportunities Online

The screenshot displays the NSPIRES (NASA Research Opportunities Online) website. At the top, there's a header with the NSPIRES logo and navigation links: Home, NASA Research, Help, and Login. Below the header, the main content area is divided into several sections. On the left, there's a sidebar with links for 'NSPIRES Home', 'Solicitations', 'Selected Proposals', 'Getting Started', 'NSPIRES Help', and 'Getting an Account'. The main content area features a 'NASA Research Opportunities' section with a brief description of the program and links to 'Solicitations' and 'Selected Proposals'. Below this, there's a 'NASA Research' section with a 'Getting Started' link. On the right side, there's a 'Member Login' section with fields for Username and Password, and links for 'Forgot Your Password?' and 'Registration Information'. At the bottom, there's a 'Site News' section with links to '2010 NRA/CAN Guidebook', 'Instructions for Confirming an Organizational Relationship', 'Challenge Question', and 'Print/Submit Proposal'. A footer at the very bottom contains the NASA logo, contact information for the Curator, and a link to download Adobe Reader.

<http://nspires.nasaprs.com/external/index.do>[5/20/2010 12:15:58 PM]

# NASA Space Technology Program



## Early Stage Innovation



Creative ideas regarding future NASA systems or solutions to national needs.

## Game Changing Technology

Prove feasibility of novel, early-stage ideas with potential to revolutionize a future NASA mission and/or fulfill national need.

## Crosscutting Capability Demonstration



Mature crosscutting capabilities that advance multiple future space missions to flight readiness status



# What's Working in Technology Infusion (1/3)

- Focusing on technologies that have clear economic and/or risk reduction impact.
  - e. g. significant savings in design time/effort, mass, volume, power, integration costs, etc.
- Emphasizing technical areas where other NASA funding sources are lacking.
- Effectively utilizing JPL engineering staff and project/mission people to attract excellent proposals; e. g. , publicizing SBIR solicitation at relevant technical conferences.
- Publicizing SBIR successes, so that program and project managers can see concrete examples of the benefits.

# What's Working in Technology Infusion (2/3)

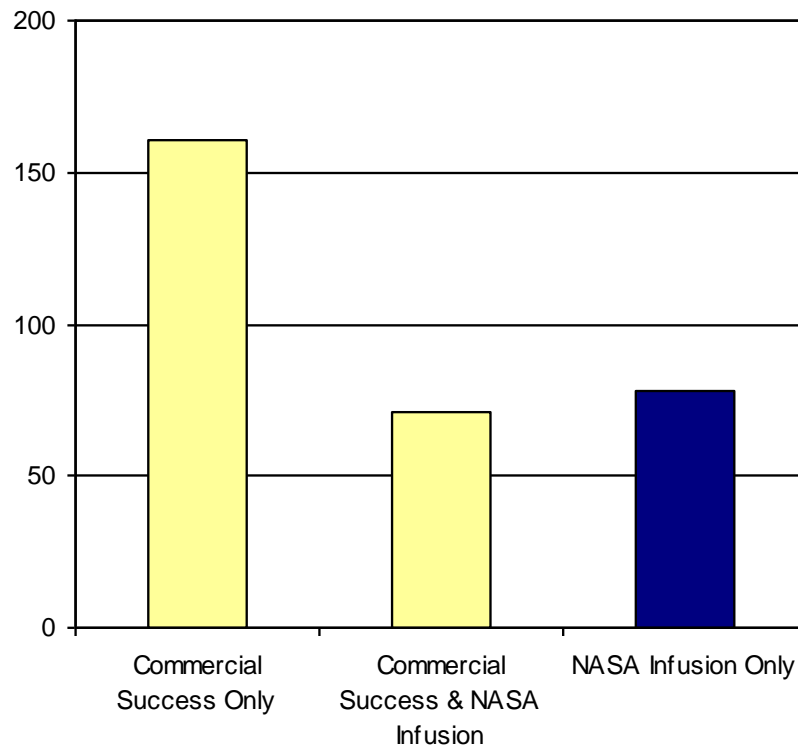
- COTRs/Technical Monitors who:
  - Make the small business aware of NASA technology requirements and effectively "champion" the technology to NASA programs and projects.
  - Communicate closely with the small business and ensure that it is on track towards NASA applications, including redirecting the SBIR technical focus if a planned application should dry up.
- Having small business interact closely with the JPL Technical Monitor and JPL SBIR Program Office, at an early stage, and tailor their SBIR work to align with NASA needs.
  - Successful infusion often requires specialized knowledge of how the relevant technology dovetails with NASA-specific mission needs.

# What's Working in Technology Infusion (3/3)

- Company has realistically assessed prospective NASA applications, including specific projects, instruments or advanced technology programs - and confirmed interest via direct communication and contacts.
- Company has a realistic, clearly defined plan and mechanism to proceed beyond Phase 2, either via their internal funding, seeking non-SBIR NASA funds, venture capital, teaming with a larger organization, or a combination.
- Company takes proactive role in pursuing NASA applications and post Phase 2 NASA funding as well as commercial applications.
- When SBIR technologies are well integrated with larger JPL technology development programs, engineers and managers are especially motivated to actively seek post Phase 2 funding.

# SMD SBIR Historical Successes

## Types of Success - SBIR Success Stories 1983-2006



Note: Some Success Stories could not be classified as either a NASA infusion event or a commercial success. Source: SMD SBIR Program Office, NASA SBIR EHB

- Among documented success stories, commercial successes outweighed NASA infusion only successes by a 3:1 ratio
- A path to commercial success may increase the likelihood that company will be able to deliver technology for infusion opportunity
- Technology whose application is too NASA specific is unlikely to pull in Non-NASA funding for further development
- Components with dual uses more likely to be commercially successful





# 2010 Master Schedule

- **2010 Solicitation Open**
  - July 7, 2010
- **2010 Solicitation Closed**
  - September 3, 2010
- **PY09 Phase 2 Selections Announced**
  - October, 2010
- **PY10 Phase 1 Selections Announced**
  - November, 2010
- **PY10 Phase 1 Awards on Contract**
  - January, 2011
- For more information, please visit: <http://sbir.nasa.gov>



# 2009 SMD SBIR Subtopics

## TOPIC S1 Sensors, Detectors, and Instruments

- S1.01 Lidar and Laser System Components
- S1.02 Active Microwave Technologies
- S1.03 Passive Microwave Technologies
- S1.04 Sensor and Detector Technology for Visible, IR, Far IR and Submillimeter
- S1.05 Detector Technologies for UV, X-Ray, Gamma-Ray and Cosmic-Ray Instruments
- S1.06 Particles and Field Sensors and Instrument Enabling Technologies
- S1.07 Cryogenic Systems for Sensors and Detectors
- S1.08 In Situ Airborne, Surface, and Submersible Instruments for Earth Science
- S1.09 In Situ Sensors and Sensor Systems for Planetary Science
- S1.10 Space Geodetic Observatory Components
- S1.11 Lunar Science Instruments and Technology

## TOPIC S2 Advanced Telescope Systems

- S2.01 Precision Spacecraft Formations for Telescope Systems
- S2.02 Proximity Glare Suppression for Astronomical Coronagraphy
- S2.03 Precision Deployable Optical Structures and Metrology
- S2.04 Advanced Optical Component Systems
- S2.05 Optics Manufacturing and Metrology for Telescope Optical Surfaces

## TOPIC S3 Spacecraft and Platform Subsystems

- S3.01 Command, Data Handling, and Electronics
- S3.02 Thermal Control Systems
- S3.03 Power Generation and Conversion
- S3.04 Propulsion Systems
- S3.05 Power Management and Storage
- S3.06 Guidance, Navigation and Control
- S3.07 Sensor and Platform Data Processing and Control
- S3.08 Planetary Ascent Vehicles
- S3.09 Technologies for Unmanned Atmospheric Platforms
- S3.10 Terrestrial Balloon Technologies

## TOPIC S4 Low-Cost Small Spacecraft and Technologies

- S4.01 Radiation Hardened High-Density Memory, High Speed Memory Controllers, Data Busses
- S4.02 Radiation Hardened Integrated Unit: GPS/IMU/Time/Processor
- S4.03 Wireless Data and/or Power Connectivity for Small Spacecraft
- S4.04 Low Cost, High Accuracy Timing Signals
- S4.05 High Torque, Low Jitter Reaction Wheels or Control Moment Gyros
- S4.06 AI&T Planner and Scheduler

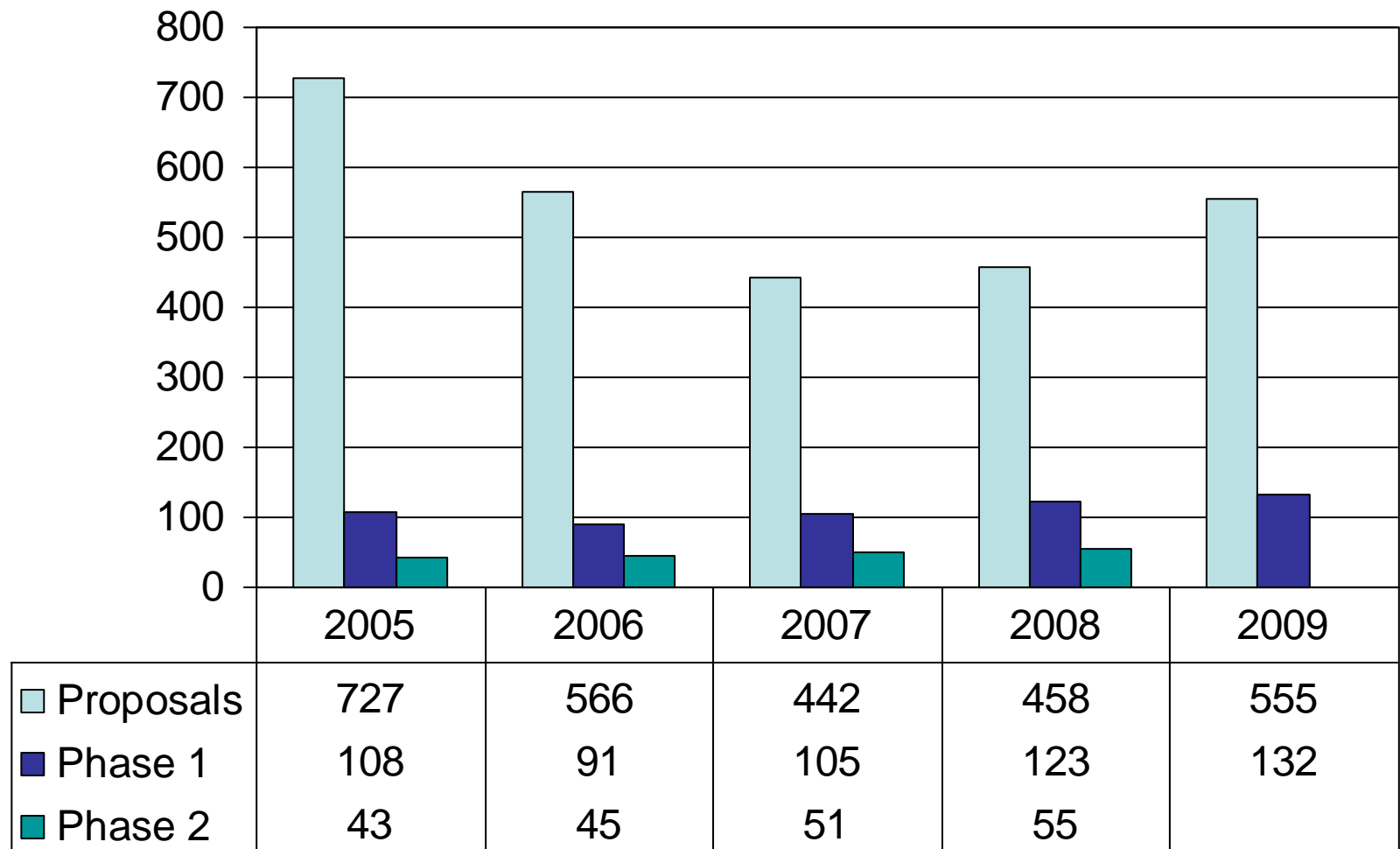
## TOPIC S5 Robotic Exploration Technologies

- S5.01 Planetary Entry, Descent and Landing Technology
- S5.02 Sample Collection, Processing, and Handling
- S5.03 Surface and Subsurface Robotic Exploration
- S5.04 Rendezvous and Docking Technologies for Orbiting Sample Capture
- S5.05 Extreme Environments Technology
- S5.06 Planetary Balloon Technology

## TOPIC S6 Information Technologies

- S6.01 Technologies for Large-Scale Numerical Simulation
- S6.02 Earth Science Applied Research and Decision Support
- S6.03 Algorithms for Science Data Processing and Analysis
- S6.04 Data Management - Mining and Visualization
- S6.05 Software Engineering Tools for Scientific Models

# SMD SBIR Proposals & Awards



Source: NASA SBIR Electronic Handbook, [ehb8.gsfc.nasa.gov](http://ehb8.gsfc.nasa.gov)





# Nature of SBIR Contracts

- SBIR contracts are fixed price contracts to be completed on a best effort basis
- Contractors own resulting intellectual property (data, copyrights, patents, etc.)
- Government has royalty-free rights for government use of intellectual property
- Government protects data from public dissemination for four years after contract ends
- Exceptions
  - If it can be reasonably demonstrated that additional funding for a Phase II contract will result in a major benefit to NASA, a request can be made to NASA SBIR for additional funding up to a maximum Phase II contract award of \$1 million
  - If a proposal is not awarded, the NASA SBIR Program will consider reversing its decision if another NASA program or project provides a minimum of 50 % of the funding

# NASA SBIR/STTR Phase 1 and 2

Phase 1 Contracts	SBIR	STTR
Maximum Contract Value	\$ 100,000	\$100,000
Maximum Period of Performance	6 months	12 months
Phase 2 Contracts	SBIR	STTR
Maximum Contract Value	\$600,000 (2009) \$750,000 (2010)	\$ 600,000
Maximum Period of Performance	24 months	24 months

- Per <http://www.zyn.com/sbir/insider/sb-insider03-30-10.htm>
  - On 3/30/2010 the Small Business Administration (SBA) published a Notice of Final Amendments to their SBIR Policy Directive.
  - SBA raised overall SBIR award ceilings to \$150,000 for Phase 1, and to \$1,000,000 for Phase 2.
  - Similar change is in work for STTR Policy Directive, but it is not yet known when it will be applied to STTR.

For more info see <http://sbir.gsfc.nasa.gov/SBIR/pgminfo.htm> and [http://www.sba.gov/aboutsba/sbaprograms/sbir/sbirstir/sbir\\_sbir\\_description.html](http://www.sba.gov/aboutsba/sbaprograms/sbir/sbirstir/sbir_sbir_description.html)



# NASA SBIR/STTR Phase 2-E

- NASA has developed a Phase 2 Enhancement (2-E) policy to further encourage transitioning SBIR research into NASA programs and the private sector.
  - Can provide a Phase 2 company with additional Phase 2 SBIR/STTR funding, matching the investment funds the company obtains from non-SBIR/STTR sources.
- Phase 2-E can extend an existing Phase 2 contract from 4 months up to one year; and match up to \$150,000 of non-SBIR/STTR funds.
- NASA has provided eligible companies with official guidance, including what types of relationships between a small company and outside investors qualify as an investment.
- To qualify for Phase 2-E:
  - During Phase 2, small business must submit a Phase 2-E application via the NASA SBIR/STTR Contract Administration and Closeout Electronic Handbook (EHB).
  - Only '07 Phase 2 companies were eligible this year.
  - Anticipate that only '08 Phase 2 companies will be eligible next year.



# NASA SBIR Phase 3

- NASA may award Phase 3 contracts for products or services with non-SBIR/STTR funds. An agency that wishes to fund a Phase 3 project is not required to conduct another competition.
- Phase 3 work may be for products, production, services, R/R&D, or any combination of these. A Federal agency may enter into a Phase 3 agreement at any time with a Phase 1 or Phase 2 awardee.
- There is no limit on the number, duration, type, or dollar value of Phase 3 awards made to a business concern.
- There is no limit on the time that may elapse between a Phase 1 or Phase 2 and a Phase 3 award.
- For more information see the NASA SBIR/STTR Proposal Solicitation.





# Phase 3 Strategies at JPL

- Tech Infusion Manager (TIM) provides overall programmatic infusion framework, helps plan and implement infusion strategies, helps identify specific applications and funding sources, reports successes, keeps prospective users informed of relevant available and developing technologies, keeps Tech Monitors motivated.
- Your Tech Monitors are one of your most valuable resources to help your technology get infused. USE THEM.
  - Take advantage of their track records of technical/programmatic credibility and connections with program and project personnel.
- When SBIR technologies are well integrated with larger JPL technology development programs, engineers and managers are especially motivated to actively seek post Phase 2 funding.
- We focus on funding and working with companies that take proactive roles in pursuing NASA applications and post Phase 2 NASA funding as well as commercial applications.

# (1/3) Proposal Review and Selection

- All proposals are competitively evaluated and judged.
- Initial administrative screening to determine responsiveness.
- Proposals passing initial screening are evaluated by NASA personnel to determine most promising technical and scientific approaches.
- Each proposal is judged on its own merits.
- Qualified experts outside of NASA (including industry, academia, and other Government agencies) may assist in performing evaluations, as needed to determine or verify merit of a proposal.
- Phase 2: Proposals with high technical merit are also reviewed for commercial merit. NASA may use a peer review panel, which may include non-NASA personnel with expertise in business development and technology commercialization.
- No quotas - NASA is under no obligation to fund any proposal - or any specific number of proposals - in a given topic. NASA may fund several - or none - of the proposed approaches to a topic or subtopic.

From the 2009 NASA SBIR/STTR Proposal Solicitation, Section 4



# (2/3) Proposal Review and Selection

## Evaluation Criteria

- Factor 1 (50%): Scientific/Technical Merit and Feasibility
- Factor 2 (25%): Experience, Qualifications and Facilities
- Factor 3 (25%): Effectiveness of Proposed Work Plan
- Sum of scores for Factors 1, 2, 3 = Technical Merit score.
- Factor 4. Commercial Potential and Feasibility (Excellent, Very Good, Average, Below Average, Poor)
- For Phase 2, includes:
  - (1) Commercial Potential and Feasibility of Innovation
  - (2) Intent and Commitment of Offeror
  - (3) Capability of Offeror to Realize Commercialization
- Scoring:
  - For Phase 1, Technical Merit is more important than Commercial Merit.
  - For Phase 2, Commercial Merit is a critical factor.

# (3/3) Proposal Review and Selection

- Proposals recommended for award are forwarded to the NASA Program Management Office (PMO) for analysis, and presented to the NASA HQ Source Selection Official (SSO) and Mission Directorate Representatives.
- Final selection decisions consider the recommendations as well as overall NASA priorities, program balance and available funding.
- The SSO has final selection authority.





# Criteria for Infusion Success

- SBIR infusion success is measured in several ways.
  - Technology directly picked up by a flight project, mission or instrument.
  - Technology targeted for further specific development, under an advanced technology program which a flight project, mission or instrument supports.
  - Technology significantly benefits direction of overall portfolio.
  - Small business either (a) sells their technology to a larger company, or (b) is bought out by a larger company, which in turn incorporates the technology into one of their product lines and/or uses it on a flight program.

# NASA SBIR/STTR and the Space Technology Program

**Mission Directorate:** Space Technology  
**Theme:** Space Technology  
**Program:** Early Stage Innovation

## FY 2011 Budget Request

Budget Authority (\$ millions)	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
<b>FY 2011 President's Budget Request</b>	<b>298.6</b>	<b>304.4</b>	<b>300.4</b>	<b>305.1</b>	<b>314.7</b>
Space Technology Research Grants	70.0	70.0	70.0	70.0	70.0
NIAC Phase I and Phase II	3.0	6.0	7.0	7.0	8.0
Center Innovations Fund	50.0	50.0	50.0	50.0	50.0
<b>SBIR/STTR</b>	<b>165.6</b>	<b>168.4</b>	<b>163.4</b>	<b>168.1</b>	<b>176.7</b>
Centennial Challenges	10.0	10.0	10.0	10.0	10.0

*Note: SBIR/STTR totals will change as amounts are calculated in accordance with current SBIR/STTR authorization.*



# Post Phase 2 Funding and the Space Technology Program

- NASA HQ is planning to allocate significant funding for mid-TRL technology development, via the Space Technology Program's Game Changing Technology and Crosscutting Capability Demonstrations elements.
- Advancement from the Early Stage Innovation element into these mid-TRL elements is not automatic. A high % of the mid-TRL funds will be competed.
- One good option is to get onto a team that is proposing to Game Changing Technology or Crosscutting Capability Demos.
  - Use your NASA points of contact – Tech Monitor/COTR, subtopic managers, TIMs, program managers, etc. as well as any non-SBIR technical or programmatic points of contact.
  - Learn as much as you can about the Space Technology Program.
  - See <http://www.nasa.gov/news/budget/index.html>

# (1/3) NASA SMD Post Phase 2 Opportunities

## In rough order of increasing TRL

Program	Purpose	Annual program budget for new awards	Number of new awards	Maximum duration of awards	Outcome	NOI Due Date (per ROSES-2010)	Proposal Due Date (per ROSES-2010)
<b>ROSES NRA D.3 Astronomy and Physics Research and Analysis (APRA)</b>	Basic research relevant to NASA's programs in astronomy and astrophysics: detector development, suborbital investigations, supporting technology, laboratory astrophysics, ground-based observations.	\$17M	42	4 to 5 yrs	SOA detector technology development for instruments that may be proposed as candidate experiments for future space flight opportunities; science or technology investigations carried out with instruments flown on suborbital sounding rockets, stratospheric balloons, or other atmospheric platforms; supporting technology or lab research directly applicable to space astrophysics missions.	1/28/11	3/25/11
<b>ROSES NRA C.13 Mars Fundamental Research</b>	Innovative scientific research concerning atmospheric, climatological, geologic, geophysical, and geochemical processes on Mars.	\$2.5-3M	25-30	3 yrs	(1) Theoretical and experimental studies, including laboratory studies of analog materials, to investigate the coupled atmospheric and geological systems on Mars; (2) Quantitative terrestrial field experiments that improve understanding of the in situ measurements that have been or that will be made on Mars; and (3) Innovative research relevant to NASA's overarching goals for the scientific exploration of Mars.	5/7/10	7/9/10
<b>ROSES NRA C.8 Lunar Advanced Science and Exploration Research</b>	Support and enhance lunar basic science and lunar exploration science as part of U.S. Space Exploration Policy's return to the Moon.	\$3M	30	4 yrs	Suite of lunar science investigations from basic science to applied exploration science.	11/26/10	1/28/11
<b>ROSES NRA A.36 Advanced Component Technology (ACT) - Solicited in 2008 but not in 2010. Expected to be competed as part of ROSES-2011 (per ESTO home page, estimated ACT NRA release is 2nd quarter FY'11)</b>	Component- and subsystem-level technology development that reduces risk, cost, size, volume, mass, and development time of Earth observing instruments and platforms, and enables new Earth observation measurements.	\$3.6M to \$4.3M	10-12	1 to 3 yrs	Bring instrument components to a maturity level that allows their integration into mission designs or other NASA technology development programs.		

# (2/3) NASA SMD Post Phase 2 Opportunities

## In rough order of increasing TRL

Program	Purpose	Annual program budget for new awards	Number of new awards	Maximum duration of awards	Outcome	NOI Due Date (per ROSES-2010)	Proposal Due Date (per ROSES-2010)
<b>ROSES NRA A.37 Advanced Instrument Systems Technology (AIST) - Solicited in 2008 but not in 2010. Expected to be competed as part of ROSES-2011 (per ESTO home page, estimated AIST NRA release is 3rd quarter FY'11)</b>	Advanced information system technologies that enable new observations and information products; increase accessibility and utility of science data; and reduce risk, cost, size, and development time for Earth science information systems.	\$8M	16-30	1 to 3 yrs	Bring information system technologies to a TRL that allows integration into existing or future research and development programs, or infusion into existing or planned subsystems/ systems.		
<b>ROSES NRA C.15 Mars Technology Project (MTP) - On hold pending programmatic decisions to be made in first quarter CY'10. Not expected that proposals for MTP will be solicited in FY'10.</b>							
<b>ROSES NRA C.19 Astrobiology Science &amp; Technology Instrument Development (ASTID)</b>	Develop instrumentation capabilities to help meet Astrobiology science requirements on future space flight missions and/or unique Earth astrobiology science objectives.	\$2.5M	8	4 yrs	Development of scientific instruments or instrument components to point where the instruments could be proposed to future flight opportunity announcements, or as small payloads associated with human exploration missions.	4/23/10	6/25/10
<b>ROSES NRA C.20 Astrobiology Science &amp; Technology for Exploring Planets (ASTEP)</b>	Investigations focused on exploring Earth's extreme environments, to develop technical and scientific basis to conduct astrobiological research on other solar system bodies.	\$4M	5	4 yrs	New science and operational/technological capabilities to enable next generation of planetary exploration.	4/2/10	5/28/10
<b>ROSES NRA C.16 Planetary Instrument Definition and Development (PIDDP)</b>	Advance spacecraft-based instrument technology for scientific investigations on future planetary missions.	\$3M	10-15	3 yrs	Develop scientific instruments or components, to point where instruments may be proposed to future announcements of flight opportunity without additional extensive technology development.	6/11/10	8/13/10



# (3/3) NASA SMD Post Phase 2 Opportunities

## In rough order of increasing TRL

Program	Purpose	Annual program budget for new awards	Number of new awards	Maximum duration of awards	Outcome	NOI Due Date (per ROSES-2010)	Proposal Due Date (per ROSES-2010)
<b>ROSES NRA C.14 Mars Instrument Development Project (MIDP) - On hold pending programmatic decisions to be made in first quarter CY'10. Not expected that proposals for MIDP will be solicited in FY'10.</b>							
<b>ROSES NRA D.11 Strategic Astrophysics Technology (TRL 4-6)</b>	Focused development of technologies that feed into and enable missions in the three Astrophysics science program areas: Exoplanet Exploration (TDEM), Physics of the Cosmos (TPCOS), and Cosmic Origins (TCOP).	TDEM: \$2.6M/yr TCOP: \$3.0M/yr TPCOS: \$2.4M/yr	TDEM: 3-10 TCOP: 1-2 TPCOS: 1-6	2 yrs	Maturation of key technologies to the point at which they are feasible for implementation in space flight missions.	1/28/11	3/25/11
<b>ROSES NRA A.35 Instrument Incubator (IIP)</b>	Demonstrate new measurement technologies which reduce risk, cost, and development time of Earth observing instruments, and enable new Earth observation measurements.	Up to \$1.5M per yr per award	15-20	1 to 3 yrs	Reduce risk of new, innovative instrument systems so they can be successfully used in future science missions to reduce overall development time.	4/21/10	7/21/10
<b>ROSES NRA A.23 Airborne Instrument Technology Transition (AITT) - Was solicited in ROSES-2009 during 1st quarter of FY'10. Not solicited in ROSES-2010.</b>	Provide airborne systems that further science and advance the use of satellite data.	\$1.0M (yr 1); \$2.5M/yr (yrs 2, 3)	4-7	3 yrs	Integrate existing instruments, developed under the NASA Instrument Incubator Program (IIP) or similar programs, onto AITT-supported platforms.		

# (1/2) NASA SMD - Potential Mission Opportunities for Newly Matured Technologies

Program	Purpose	Annual program budget for new awards	Number of new awards	Maximum duration of awards	Outcome
<b>Stand-Alone Missions of Opportunity (SALMON)</b>	<p>Focused space flight investigations that offer high scientific or technical value for modest cost.</p> <ul style="list-style-type: none"> <li>•Partner Missions of Opportunity (PMOs)</li> <li>•U.S. Participating Investigators (USPIs)</li> <li>•New Science Missions using Existing Spacecraft</li> <li>•Small Complete Missions (SCMs)</li> <li>•Focused Missions of Opportunity (FMOs)</li> </ul>	<ul style="list-style-type: none"> <li>•PMOs: \$35M.</li> <li>•USPIs: Individuals: \$125K/yr. Teams: \$125k/investigator/yr up to \$1M/yr.</li> <li>•New Science Missions using Existing Spacecraft: TBD.</li> <li>•SCMs: \$2M (Astrobiology Small Payloads), \$1.5M (Fundamental Space Biology)</li> <li>•FMOs: TBD.</li> </ul>	<ul style="list-style-type: none"> <li>•PMOs: 1 or more that fit under cost cap.</li> <li>•USPIs: 1-8</li> <li>•New Science Missions using Existing Spacecraft: TBD.</li> <li>•SCMs: Probably 1.</li> <li>•FMOs: TBD.</li> </ul>	<ul style="list-style-type: none"> <li>•PMOs: Varies.</li> <li>•USPIs: 5 yrs</li> <li>•New Science Missions using Existing Spacecraft: TBD.</li> <li>•SCMs: Latest launch date 6/30/2011.</li> <li>•FMOs: TBD.</li> </ul>	<p>Focused science and technology investigations that conclude with published peer-reviewed articles, and deposition of reduced and calibrated data in designated data archives. If any instrument or spacecraft components are below TRL 6, the Mission Implementation section must justify the proposed new technologies and approach to reduce associated risks to mission cost, schedule, and science objectives.</p>
<b>ROSES NRA A.39 ESSP Venture-Class Science Investigations (mature technologies)</b>	<p>Conduct complete suborbital, principal investigator-led investigations to conduct innovative, integrated, hypothesis or scientific question driven approaches to pressing Earth system science issues.</p>	\$30M over life cycle	5	5 yrs	<p>Measurements that address weaknesses in current Earth system models leading to improvement in modeling capabilities; data sets that identify and characterize important phenomena and/or detecting and characterizing changes in the Earth system; and/or measurements that apply to the scientific goals of multiple Earth Science focus areas and/or disciplinary programs.</p>
<b>New Frontiers (NF-3 AO) proposals</b>	<p>Science-driven program aimed at characterizing and understanding the bodies that constitute our solar system (excluding Earth and Sun). Its larger purpose is to illuminate the origin, evolution, and current state of the solar system.</p>	\$2.5M for Phase A concept study. \$650M total mission cost	3 Phase A concept studies; 1 mission	10 months for Phase A concept study; Total mission constrained by 12/2018 launch deadline	<p>This AO solicits flight missions. Proposed investigations are generally expected to have mature technologies, TRL 6 or higher. A limited number of less mature technologies are permitted, as long as they contain a plan for maturing to TRL 6 no later than Confirmation Review, and adequate backup plans in the event that the technologies cannot be matured as planned.</p>

# (2/2) NASA SMD - Potential Mission Opportunities for Newly Matured Technologies

Program	Purpose	Annual program budget for new awards	Number of new awards	Maximum duration of awards	Outcome
<b>Explorers Program - UNEX</b>	Provide frequent flight opportunities for world-class scientific investigations from space utilizing innovative, streamlined and efficient management approaches in heliophysics and astrophysics.	Not to exceed \$15.0M	Varies	Varies	Investigations characterized by definition, development, launch service, and mission operations and data analysis. UNEX missions will be launched by a variety of low cost methods. Website: <a href="http://explorers.gsfc.nasa.gov/schedule.html">http://explorers.gsfc.nasa.gov/schedule.html</a>
<b>Explorers Program - SMEX</b>	Provide frequent flight opportunities for world-class scientific investigations from space utilizing innovative, streamlined and efficient management approaches in heliophysics and astrophysics.	Not to exceed \$120 million	Varies	Varies	Investigations characterized by definition, development, launch service, and mission operations and data analysis. Website: <a href="http://explorers.gsfc.nasa.gov/schedule.html">http://explorers.gsfc.nasa.gov/schedule.html</a>
<b>Explorers Program - MIDEX</b>	Provide frequent flight opportunities for world-class scientific investigations from space utilizing innovative, streamlined and efficient management approaches in heliophysics and astrophysics.	Not to exceed \$180 million	Varies	Varies	Investigations characterized by definition, development, launch service, and mission operations and data analysis. Website: <a href="http://explorers.gsfc.nasa.gov/schedule.html">http://explorers.gsfc.nasa.gov/schedule.html</a>
<b>Explorers Program - Missions of Opportunity</b>	Provide frequent flight opportunities for world-class scientific investigations from space utilizing innovative, streamlined and efficient management approaches in heliophysics and astrophysics.	Under \$35M	Varies	Varies	Investigations characterized by being part of a non-NASA space mission of any size. These missions are conducted on a no-exchange-of-funds basis with the organization sponsoring the mission. NASA intends to solicit proposals for Missions of Opportunity with each AO issued for UNEX, SMEX, and MIDEX. Website: <a href="http://explorers.gsfc.nasa.gov/schedule.html">http://explorers.gsfc.nasa.gov/schedule.html</a>

# Establishing NASA Points of Contact

- We may communicate with companies about NASA/JPL needs, technical relevance, applications, technical subtopic details and clarifications, etc.
  - The one exception is the Blackout Period (from Solicitation Release in early July through Phase I Awards Announcement in November).
- You are encouraged to contact us!
  - If you do not already have NASA technical point(s) of contact, you can contact the SBIR TIM or the Field Center Program Manager at the desired Center(s).
    - <http://sbir.gsfc.nasa.gov/SBIR/pgminfo.htm>
    - We can provide you with relevant leads and points of contact.



# Current Review Criteria

- **Factor 1. Scientific/Technical Merit and Feasibility:** The proposed R/R&D effort will be evaluated on whether it offers a clearly innovative and feasible technical approach to the described NASA problem area. Proposals must clearly demonstrate relevance to the subtopic. Specific objectives, approaches and plans for developing and verifying the innovation must demonstrate a clear understanding of the problem and the current state of the art. The degree of understanding and significance of the risks involved in the proposed innovation must be presented.
- **Factor 2. Experience, Qualifications and Facilities:** The technical capabilities and experience of the PI or project manager, key personnel, staff, consultants and subcontractors, if any, are evaluated for consistency with the research effort and their degree of commitment and availability. The necessary instrumentation or facilities required must be shown to be adequate and any reliance on external sources, such as Government Furnished Equipment or Facilities, addressed (Section 5.15).
- **Factor 3. Effectiveness of the Proposed Work Plan:** The work plan will be reviewed for its comprehensiveness, effective use of available resources, cost management and proposed schedule for meeting the Phase 1 objectives. The methods planned to achieve each objective or task should be discussed in detail.
- **Factor 4. Commercial Potential and Feasibility:** The proposal will be evaluated for the commercial potential and feasibility of the proposed innovation and associated products and services. The offeror's experience and record in technology commercialization, co-funding commitments from private or non-SBIR funding sources, existing and projected commitments for Phase 3 funding, investment, sales, licensing, and other indicators of commercial potential and feasibility will be considered along with the initial commercialization strategy for the innovation. Commercialization encompasses the infusion of innovative technology into products and services for NASA mission programs, other Government agencies and non-Government markets.
- **Scoring of Factors and Weighting:** Factors 1, 2, and 3 will be scored numerically with Factor 1 worth 50 percent and Factors 2 and 3 each worth 25 percent. The sum of the scores for Factors 1, 2, and 3 will comprise the Technical Merit score. The evaluation for Factor 4, Commercial Potential and Feasibility, will be in the form of an adjectival rating (Excellent, Very Good, Average, Below Average, Poor). For Phase 1 proposals, Technical Merit carries more weight than Commercial Merit.





# Center SMD SBIR Points of Contact

Center	Name	Email	Phone
<b>Ames</b>	Kim Hines	<a href="mailto:Kimberly.K.Hines@nasa.gov">Kimberly.K.Hines@nasa.gov</a>	(650) 604-5582
<b>Dryden</b>	Ron Young	<a href="mailto:Ronald.M.Young@nasa.gov">Ronald.M.Young@nasa.gov</a>	(661) 276-3741
<b>Glenn</b>	Gynelle Steele	<a href="mailto:Gynelle.C.Steele@nasa.gov">Gynelle.C.Steele@nasa.gov</a>	(216) 433-8258
<b>Goddard</b>	Stephen Rinehart	<a href="mailto:Stephen.A.Rinehart@nasa.gov">Stephen.A.Rinehart@nasa.gov</a>	(301)286-4591
<b>Johnson</b>	Kathy Packard	<a href="mailto:Kathleen.Packard@nasa.gov">Kathleen.Packard@nasa.gov</a>	(281) 244-5378
<b>JPL</b>	Carol Lewis	<a href="mailto:Carol.R.Lewis@jpl.nasa.gov">Carol.R.Lewis@jpl.nasa.gov</a>	(818) 354-3767
<b>Kennedy</b>	Joni Richards	<a href="mailto:Joni.M.Richards@nasa.gov">Joni.M.Richards@nasa.gov</a>	(321) 867-2225
<b>Langley</b>	Robert Yang	<a href="mailto:Robert.L.Yang@nasa.gov">Robert.L.Yang@nasa.gov</a>	(757) 864-8020
<b>Marshall</b>	Lynn Garrison	<a href="mailto:Virginia.B.Garrison@nasa.gov">Virginia.B.Garrison@nasa.gov</a>	(256) 544-6719
<b>Stennis</b>	Ray Bryant	<a href="mailto:Ray.Bryant-1@nasa.gov">Ray.Bryant-1@nasa.gov</a>	(228) 688-3964